

## **AMENDMENTS TO THE SPECIFICATION**

Please amend paragraphs 11, 15, 18, 24, 35, 36, and 39 of the specification as follows:

[0011] Applicant has found that materials that work flow under pressure and shear, flow better with increased shear and temperature, are partially crystalline at room temperature.

Transformation of a lubricant system to a liquid phase, preferably takes place at about 4 tons per square inch at room temperature, a very low end of the working pressure of a press. The faster a press runs, the more shear is generated and temperature due to particle-to-particle friction. Both of these actions reduce the viscosity of a lubricant system. Normal press operations impart to a part a temperature of about 90° to about 140°F. Thus, applicant has found that a lubricant system that displays a viscosity range of from about 1000 to about 6000 poise at a shear rate of ~~1000~~ 1/second 1000/second and a temperature of 100°F, performs well. By taking advantage of the shear thinning properties of the lubricant system, non-dusting metal mixes can be made without the use of solvents, thereby also resulting in metal mixes with reduced segregation of components, and the loss and segregation of minor ingredients. Also, preferably there is a strong attraction by the lubricant system to the surface of the metal particles. Further, preferably the lubricant system cleanly burns during the firing or sintering of the green part, with no formation of undesired residual metals or undesired reduced metals. Additionally, the lubricant system of the present invention permits the operation of presses at much greater loads leading to improved green densities and parts free of defects such as blisters and delaminations.

[0015] The particular acid used to make the reaction product of guanidine and an acid is selected based upon obtaining desired effects when mixed with other compounds. In one embodiment, the guanidine material is guanidine stearate. In one embodiment, the guanidine material includes guanidine ethyl-~~hexonate~~ hexanoate. In other embodiments, the guanidine material may be the reaction product of guanidine and other acids. The many acids which may be reacted with the guanidine to form the reaction product of guanidine and an acid are described in detail hereafter.

[0018] In a preferred embodiment, the guanidine material comprises a mixture of guanidine stearate and guanidine ethyl-~~hexonate~~ hexanoate.

[0024] In one embodiment, the lubricant system comprises by weight from about 5% to about 35% fatty acid and from about 0.5% to about 50% guanidine material. In another embodiment, the lubricant system includes by weight from about 30% to about 65% amide wax. In one preferred embodiment the lubricant system comprises by weight from about 5% to about 15% by weight lauric acid, from about 5% to about 15% by weight stearic acid, from about 40% to about 60% amide wax and from about 25% to about 40% guanidine material. Preferably, the guanidine material comprises a mixture of guanidine stearate and guanidine ethyl-~~hexonate~~ hexanoate. In one embodiment the guanidine stearate comprises by weight 10% to about 25% of the lubricant system, and the guanidine ethyl-~~hexonate~~ hexanoate comprises about 10% to about 20% of the lubricant system.

[0035] A mixture was prepared comprising by weight the following components:

10%	lauric acid
10%	stearic acid (impure comprising about 45% by weight palmitic acid)
50%	ACRAWAX® C - Lonza, Inc.
13.5%	guanidine stearate
16.5%	guanidine ethyl- <del>hexonate</del> <u>hexanoate</u>

[0036] The lauric and stearic acids were preground in a Waring Blender to a particle size of about 100 mesh. All components ~~are~~ were then double cone mixed followed by melt mixing at 60°C. The melt mixed product was then cryogenically ground to provide a particle size of about 10 to about 25 ~~μ~~ microns.

[0039] Additional lubricant systems made in accordance with the present invention A, B, C, D and E were prepared by mixing the components followed by batch melting. After melting the material was cooled and then cryogenically ground to about 10 to about 25  $\mu$  microns. The systems comprised by weight the following components:

Component	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>
Lauric Acid	10.0	5.0	15.0	10.0	
Stearic Acid (Impure comprising about 45% by weight palmitic acid)	10.0	15.0	15.0	10.0	
ACRAWAX® C Lonza, Inc.	50.0	50.0		50.0	50.0
Guanidine Stearate	<u>0.45</u>			12.3	<u>0.45</u>
Guanidine Ethyl- <del>hexonate</del> <u>hexanoate</u>	<u>0.55</u>			17.7	<u>0.55</u>
Micro-crystalline Wax M7381 Moore & Munger Marketing, Inc.	11.9	12.0	10.0		12
Polyethylene Copolymer Wax 520 Clariant Corporation	17.1	18.0	10.0		18
Butyl Stearate Wax (Liquid)					9.5
Lithium Stearate <sup>1</sup>			50.0		
Glycerol Monostearate-Emerest 240 Cognis Corporation					9.5

<sup>1</sup>Mixture by weight of 86.4% stearic acid and 13.6% lithium hydroxide monohydrate

Please amend the Table that appears between paragraphs 40 and 41 of the application as follows:

**Lubricant System And Metal Powder**

Properties	129L U.S. Bronze <sup>1</sup> 0.75% <sup>5</sup> (Conventional) (40 TSI)	129L U.S. Bronze <sup>1</sup> 0.30% A (40 TSI)	Hoeganes 85HP <sup>2</sup> 0.75% Aerawax ACRAWAX® (Conventional) (60 TSI)	Hoeganes 85HP <sup>2</sup> 0.25% A (60 TSI)	Ampal AMB 2712 PMP <sup>3</sup> 1.5% Aerawax ACRAWAX® (Conventional) (30 TSI)	Ampal AMB 2712 PMP <sup>3</sup> 0.30% A (30 TSI)	Ametek 304L <sup>4</sup> 1.00% Aerawax ACRAWAX® (Conventional) (60 TSI)	Ametek 304L <sup>4</sup> 0.25% A (60 TSI)
Green Density	7.72 g/cc	7.76 g/cc	7.22 g/cc	7.35 g/cc	2.64 g/cc	2.67 g/cc	6.80 g/cc	6.80 g/cc
Green Strength	1804 psi	2887 psi	1874 psi	2034	997	1533 psi	1447 psi	1223 psi
Green Spring	0.26%	0.23%	0.28%	0.30%	0.17%	0.25%	0.35%	0.41
Break-away Ejected Pressure	1533 lbf	1637 lbf	2584 lbf	3217 lbf	889 lbf	1528 lbf	2682 lbf	3374 lbf
Peak Stripping Pressure	2057 lbf	1952 lbf	2092 lbf	2742 lbf	842 lbf	1408 lbf	2375 lbf	2867 lbf

<sup>1</sup> 78% copper, 20.5% zinc, 1.5% lead (by weight)

<sup>2</sup> Iron base with 2.0% nickel and 0.5% carbon (by weight)

<sup>3</sup> Proprietary blend of aluminum, copper, magnesium and silica

<sup>4</sup> Proprietary 304 stainless steel

<sup>5</sup> Equal blend by weight of zinc stearate and lithium stearate

TSI = Tons Per Square Inch